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Europäisches  
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recherche

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Anmeldung Nr./Application No./Demande n°/Patent Nr./Patent No./Brevet n°.  
00961147.6

Anmelder/Applicant/Demandeur/Patentinhaber/Proprietor/Titulaire  
MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.

## COMMUNICATION

The European Patent Office herewith transmits

- the European search report
- the declaration under Rule 45 EPC
- the partial European search report under Rule 45 EPC
- the supplementary European search report concerning the international application under Article 157(2) EPC relating to the above-mentioned European patent application. Copies of the documents cited in the search report are enclosed.

The following specifications given by the applicant have been approved by the Search Division :

Abstract                     Title                     Figure

The abstract was modified by the Search Division and the definitive text is attached to this communication.

The following figure will be published with the abstract, since the Search Division considers that it better characterises the invention than the one indicated by the applicant.

Figure:

Additional copy(copies) of the documents cited in the European search report.

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## REFUND OF THE SEARCH FEE

If applicable under Article 10 Rules relating to fees, a separate communication from the Receiving Section on the refund of the search fee will be sent later.



### CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
  
- No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

### LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
  
- As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
  
- Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
  
- None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1 and 3 in part and 6,7

This invention is directed to a polymer electrolyte fuel cell comprising a gas diffusion electrode impregnated partly with an ionomer (polymer electrolyte), wherein the special technical feature resides in providing a seamless variation of gas permeability across the electrode thickness, in particular by ensuring a seamless gradient of pore distribution across the electrode's thickness.

2. Claims: 1 and 3 in part, 2, 8-11

This invention is directed to a polymer electrolyte fuel cell comprising a gas diffusion electrode impregnated partly with an ionomer (polymer electrolyte) and to a respective method of fabrication, wherein the special technical feature resides in providing a seamless variation of the amount of hydrogen conductive polymer material across the electrode thickness to respectively influence its local ionic conductivity.

3. Claims: 1 and 3 in part, 4, 5

comprising a gas diffusion electrode impregnated partly with an ionomer (polymer electrolyte), wherein the special technical feature resides in providing at least one catalyst-free polymer conductive layer disposed between the porous substrate of the gas diffusion electrode and a composite layer comprising catalyst and polymer electrolyte.



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Y	WO 99 40237 A (CALIFORNIA INST OF TECHN) 12 August 1999 (1999-08-12) * page 9, line 23 - page 12, line 14; figures 1,2 *	1,3,6,7	H01M8/02H01M8/10 H01M8/10
Y	DE 196 47 534 A (DORNIER GMBH) 28 May 1998 (1998-05-28) * column 2, line 21-33 * * column 3, line 60 - column 4, line 58 * * column 5, line 12 - column 6, line 23; figure 1 * * column 4, line 62-68 *	1,3,6,7	
Y	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 01, 29 January 1999 (1999-01-29) & JP 10 270051 A (OSAKA GAS CO LTD;UNITIKA LTD), 9 October 1998 (1998-10-09) * abstract *	1	
Y	---	1,3	
Y	US 5 501 915 A (HARDS GRAHAM A ET AL) 26 March 1996 (1996-03-26) * column 3, line 48-58 * * column 4, line 65 - column 6, line 50; example 1 *	1,3	
X	PATENT ABSTRACTS OF JAPAN vol. 1996, no. 08, 30 August 1996 (1996-08-30) & JP 08 088008 A (TOYOTA MOTOR CORP), 2 April 1996 (1996-04-02) * abstract * * figures 3,5 *	1-4,6-9	
Y	---	10,11	
	---	-/-	
The supplementary search report has been based on the last set of claims valid and available at the start of the search.			
4	Place of search MUNICH	Date of completion of the search 19 March 2004	Examiner Thanos, I
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document			



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	EP 0 687 023 A (VITO) 13 December 1995 (1995-12-13)	1,4,5,8, 9	
Y	* page 3, line 34 - page 4, line 29; examples 1,2 *	10,11	
A	* page 4, line 27-29 *	5	
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Y	DD 88 122 A (DR. E. HOLLAX ET AL) 24 July 1970 (1970-07-24)	10,11	
	* column 2, line 5-29 *		
	* column 3, line 6-26 *		
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X	US 5 882 810 A (REHG TIMOTHY J ET AL) 16 March 1999 (1999-03-16)	1,4,8	
A	* column 2, line 24-39 *	5	
	* column 2, line 54 - column 4, line 14; figure 1; example 1 *		
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A	US 5 523 177 A (CROPLEY CECELIA C ET AL) 4 June 1996 (1996-06-04)	1,8	
	* column 4, line 30 - column 5, line 33; figure 2; example 1 *		
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The supplementary search report has been based on the last set of claims valid and available at the start of the search.			
4	Place of search MUNICH	Date of completion of the search 19 March 2004	Examiner Thanos, I
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document			

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 00 96 1147

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

19-03-2004

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